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EXAMINER	
CHOW, JEFFREY J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,063	WONG ET AL.	
	Examiner	**Art Unit**	
	Jeffrey J. Chow	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26 and 31-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26 and 31-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments regarding claims 1 – 26 and 31 – 35, filed 12 May 2008, have been fully considered but they are not persuasive.

Applicant argues Hutson (US 5,175,710) does not teach the relationship between the singular vectors and the display, specifically, the members of "a second group" of data vectors are "projected onto" the visualization as a function of the singular vectors (page 9). Hutson teaches data is compressed by 82%, allowing data to be displayed (column 6, lines 41 – 50). The compressed data are represented by using singular vectors Q_t (64) and singular values D (62) (column 6, lines 41 – 50). Though the passage was cited and showed compressed data was displayed, the passage also contains where the compressed data came from. The abstract even discloses the use of singular values and singular vectors to produce an enhanced three-dimensional matrix for display.

Applicant argues Hutson does not teach the projecting being performed in response to an increase in rate of receipt of the stream of data vectors (page 9) with the reasoning that Hutson doesn't teach the projecting each vector within a second group onto a visualization as a result of a perceived increase in the number of data vectors (pages 9 and 10). Hutson teaches the data obtained from the spherical array of hydrophones is processed similarly to data obtained by a towed array of hydrophones and the data is displayed on a three-part display: the top portion 270 is updated at a fast rate (every 6 seconds), a middle portion 272 is averaged and updated at a slower rate (every 10 seconds), and a bottom portion 274 is averaged and updated at an even slower rate (every 40 seconds) (column 15, lines 36 – 48). The reason why the update for each

part of the display is different because of the frequency bands at which the data are monitored and received. Higher frequency of a data would have more data to be processed and therefore displayed and updated more frequently than lower frequency data. Therefore, higher the frequency of a data, the faster the update of the display would be.

Applicant argues Hutson does not teach the execution of a multi-dimensional scaling routine on a set of data vectors (page 10). Hutson teaches the singular values D (62) are displayed in a diagonal form and represent the weights used to adjust the singular vectors and the input data is post-multiplied by the right singular vectors to enhance the input data and enhance the input data by pre-multiplying the input data by the left singular vectors (column 6, lines 27 – 40). The singular values represent the multi-dimensional scaling.

Applicant argues Hutson does not teach wavelet decomposition (page 11). Chakrabarti et al. (US 6,760,724) is used to teach this limitation.

Applicant argues that Hutson fails to show updating the projection with one or more data vectors (page 11). Hutson teaches real-time analysis (column 1, lines 63 – 65) and data is stored and analyzed, being continually updated as new data is received (column 4, lines 26 – 30).

Applicant argues that there would be no reason to modify Hutson so as to be able to accommodate a variable incoming data rate (page 12) with the reasoning that system parameters would not likely be changed and thus incoming data stream would essentially be at a fixed rated (page 12). "would not likely" does not mean Hutson teaches away from a variable incoming data rate and "essentially" does not mean it is inherent that Hutson uses a fixed incoming data rate. Therefore it is appropriate to modify Hutson with the teachings of Schkilnik et al. (US 2003/0152069) variable incoming data rate (paragraph 17).

Applicant argues Hutson does not teach generating a second visualization by updating a first visualization with one or more additional vectors corresponding to data received above the defined rate (page 12). Hutson teaches real-time analysis (column 1, lines 63 – 65) and data is stored and analyzed, being continually updated as new data is received (column 4, lines 26 – 30). Therefore, updating the first visualization would be calculating at least the second portion, creating a second visualization.

Applicant argues the combination of Hutson and Chakrabarti is impermissible hindsight (page 13). In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Hutson and Chakrabarti both deal with reducing data to have a compressed representation of the data (Chakrabarti; column 3, line 66 – column 4, line 13: wavelet decomposition can be used to effectively generate compact representations that exploit the structure of data). Therefore it would have been obvious for one of ordinary skill in the art to modify Hutson's system to use Haar wavelet decomposition. Since Chakrabarti recognizes the advantage of using Haar wavelet decomposition, it is not impermissible hindsight.

The 35 U.S.C. 101 rejections have been withdrawn due to applicant’s cancellation of claims 27 – 30.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3 – 5, 21, 23, 24, 26, 31, 33, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Hutson (US 5,175,710).

Regarding independent claim 1, Hutson teaches a method, comprising

processing a stream of data vectors (column 4, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a "bearing time record" (BTR)),

generating a visualization from a first group of the data vectors (Figure 6: shows the output display of a BTR image 70),

determining a set of values corresponding to one or more eigenvectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors) for a matrix defined with the first group of the data vectors (column 6, lines 1 – 6: a matrix 72 provides a numerical representation of the BTR image for display), and

projecting each member of a second group of the data vectors onto the visualization as a function of the set of values (column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed by using singular vectors Q_t(64) and singular values D (62)).

Regarding dependent claim 3, Hutson teaches representing a number of images with the data vectors (column 1, lines 49 – 57: digital image can be formed from a variety of input data signals, including seismic, radar, radio, video and film).

Regarding dependent claim 4, Hutson teaches generating includes performing a multidimensional scaling routine with the first group of the data vectors (column 6, lines 27 – 40: singular vectors and/or singular values are used by the real-time multi-dimensional processing system as a filter to enhance and/or suppress features within the BTR data) to generate the visualization in the form of a scatter plot (Figure 8: display of time versus bearing in different frequency bands).

Regarding dependent claim 5, Hutson teaches projecting is performed in response to an increase in rate of receipt of the stream of the data vectors (column 15, lines 36 - 48: the data is displayed by a bearing-by-time display, which would be presented to an operator for a selected D/E angle in a three-part display: the top portion 270 is updated at a fast rate, a middle portion 272 is averaged and updated at a slower rate, and a bottom portion 274 is averaged and updated at an even slower rate).

Regarding independent claim 21, Hutson teaches a method, comprising

receiving a data stream (column 4, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a "bearing time record" (BTR)),

processing a stream of data vectors corresponding to the data stream (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors),

visualizing at least a portion of the data stream (Figure 6: shows the output display of a BTR image 70) by executing a multidimensional scaling routine with at least a corresponding portion of the data vectors (column 6, lines 27 – 40: the singular values D (62) are displayed in a diagonal form and represent the weights used to adjust the singular vectors and the input data is post-multiplied by the right singular vectors to enhance the input data and enhance the input data by pre-multiplying the input data by the left singular vectors), and

performing at least one of vector sampling and vector dimension reduction on a group of the data vectors to provide a data set with a reduced number of data elements relative to the group of the data vectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed).

Regarding dependent claim 23, Hutson teaches the data stream includes at least one of a number of text documents and a number of images (column 1, lines 49 – 57: digital image can be formed from a variety of input data signals, including seismic, radar, radio, video and film).

Regarding dependent claim 24, Hutson teaches generating a visualization with the data set (Figure 6: shows the output display of a BTR image 70).

Regarding dependent claim 26, Hutson teaches updating a visualization provided by said visualizing with one or more additional data vectors as a function of one or more eigenvectors determined from the corresponding portion of the data vectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed; column 1, lines 63 – 65: real-time analysis; column 4, lines 26 – 30: data is stored and analyzed, being continually updated as new data is received).

Regarding independent claim 31, Hutson teaches a system, comprising

a data communication subsystem operable to receive a data stream (column 4, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a "bearing time record" (BTR)),

a processing subsystem responsive to the data communication subsystem to generate a visualization output based on a group of data vectors corresponding to a first portion of the data stream (Figure 6: shows the output display of a BTR image 70), the processing subsystem being further responsive to a rate of receipt of the data stream to modify the visualization output

(column 15, lines 36 - 48: the data is displayed by a bearing-by-time display, which would be presented to an operator for a selected D/E angle in a three-part display: bottom portion 274 is averaged and updated at an even slower rate) with one or more other data vectors corresponding to a second portion of the data stream as a function of eigenspace defined with the group of data vectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed; column 1, lines 63 – 65: real-time analysis; column 4, lines 26 – 30: data is stored and analyzed, being continually updated as new data is received), and

a display device responsive to the visualization output to provide a corresponding visualization (column 15, lines 36 – 48: three part display).

Regarding dependent claim 33, Hutson teaches the visualization output generated from the group of data vectors is provided in accordance with a multidimensional scaling routine executed by the data processing subsystem (column 6, lines 27 – 40: singular vectors and/or singular values are used by the real-time multi-dimensional processing system as a filter to enhance and/or suppress features within the BTR data).

Regarding independent claim 34, claim 34 is similar in scope as to claim 21, thus the rejection for claim 21 hereinabove is applicable to claim 34.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6 and 9are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Aggarwal et al. (US 6,505,207).

Regarding dependent claim 6, Hutson did not expressly disclose projecting includes determining a dot product of each member of the second group of the data vectors and at least one of the one or more eigenvectors. Aggarwal discloses transform the data into new set of features by calculating the dot product between the vector representation and the eigenvector of the covariance matrix (column 5, line 62 – column 6, line 11). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hudson's system to take the dot product of the eigenvector and the new data in vector form. One would be motivated to do

so because this would provide another method to reduce the number of data to be able to display on a graph.

Regarding dependent claim 9, Hutson did not expressly disclose generating includes determining a dot product between each of the one or more additional data vectors and one or more eigenvectors corresponding to the eigenspace. Aggarwal discloses transform the data into new set of features by calculating the dot product between the vector representation and the eigenvector of the covariance matrix (column 5, line 62 – column 6, line 11). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hudson's system to take the dot product of the eigenvector and the new data in vector form. One would be motivated to do so because this would provide another method to reduce the number of data to be able to display on a graph.

Claims 7, 16, 17, 19, 20, 22, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Chakrabarti et al. (US 6,760,724).

Regarding dependent claim 7, Hutson did not expressly disclose generating a data set representative of a portion of the stream of the data vectors by performing at least one of sampling the portion of the stream of data vectors, and reducing dimension of each of a plurality of the data vectors by wavelet decomposition. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the

input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.

Regarding independent claim 16, Hutson teaches a method, comprising

receiving a data stream (column 4, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a "bearing time record" (BTR)),

processing a group of data vectors corresponding to the data stream (Figure 6: shows the output display of a BTR image 70).

Hutson did not expressly disclose generating a reduced data set which includes reducing dimension of the data vectors with wavelet decomposition, and providing a representation with the reduced data set corresponding to a visualization of a portion of the data stream, however Hutson discloses matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors (column 5, lines 60 – 67) and data is compressed by 82%, allowing data to be displayed (column 6, lines 41 – 50). Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to replace Hutson's decomposition with Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because wavelet decomposition method can be used to effectively generate compact representations that exploit the structure of data and Haar wavelets are conceptually simple, very fast to compute, and perform well in a variety of applications.

Regarding dependent claim 17, Hutson teaches visualizing a part of the data stream in accordance with a multidimensional scaling routine (column 6, lines 27 – 40: singular vectors and/or singular values are used by the real-time multi-dimensional processing system as a filter to enhance and/or suppress features within the BTR data).

Regarding dependent claim 19, Hutson teaches the data stream corresponds to at least one of a number of text documents and a number of images (column 1, lines 49 – 57: digital image can be formed from a variety of input data signals, including seismic, radar, radio, video and film).

Regarding dependent claim 20, Hutson did not expressly disclose generating includes performing the wavelet decomposition with Haar wavelets. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.

Regarding dependent claim 22, Hutson did not expressly disclose the dimension reduction routine includes wavelet decomposition. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate

ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.

Regarding independent claim 35, claim 35 is similar in scope as to claim 16, thus the rejection for claim 16 hereinabove is applicable to claim 35.

Claims 2 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Deerwester et al. ("Indexing by Latent Semantic Analysis).

Regarding dependent claim 2, Hutson did not expressly disclose representing a number of text documents with the data vectors. Deerwester discloses indexing and retrieval documents (abstract). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries.

Regarding dependent claim 18, Hutson did not expressly disclose performing a similarity analysis with the representation. Deerwester discloses indexing and retrieval documents (abstract) and a document matrix that contain the frequency of which a term occurs in a document (pg, 10: Table 2). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs and to utilize

a document matrix to obtain a frequency certain terms occur in a document. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries

Claims 8, 10, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Schkilnik et al. (US 2003/0152069).

Regarding independent claim 8, Hutson teaches a method, comprising

receiving a first portion of a data stream at or below a defined rate (column 4, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a "bearing time record" (BTR)),

generating a first visualization from a group of data vectors corresponding to the first portion (Figure 6: shows the output display of a BTR image 70).

Hutson did not expressly disclose receiving a second portion of the data stream above the defined rate. Schkilnik discloses receiving a plurality of data streams at a first speed and combines the plurality of data streams into one or more data streams with a second, higher speed (paragraph 17). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to additionally accommodate receiving a plurality of data steams at faster rate than the normal speed while receiving data at two different rates. One would be motivated to do so is to efficiently process data and utilize a processor at any given time.

Hutson teaches generating a second visualization by updating the first visualization with one or more additional data vectors as a function of an eigenspace defined with the group of data

vectors, the one or more additional data vectors corresponding to the second portion of the data stream (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed; column 1, lines 63 – 65: real-time analysis; column 4, lines 26 – 30: data is stored and analyzed, being continually updated as new data is received).

Regarding dependent claim 10, Hutson teaches providing a reduced data set by performing at least one of a dimension reduction routine and a sampling routine with a number of data vectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed).

Regarding dependent claim 13, Hutson did not expressly disclose providing a third visualization based on the reduced data set, however Hutson discloses compressing data, allowing it to be displayed (column 6, lines 41 – 50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hutson’s system by applying the compression method on the already compressed data to achieve a better compressed data and it

could be used to achieve the predictable result of having a further compressed data that represents the overall picture of the original data.

Regarding dependent claim 15, Hutson teaches the first visualization (Figure 6: shows the output display of a BTR image 70) and the second visualization each corresponding to a different scatter plot (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Schkilnik et al. (US 2003/0152069) and Agrafiotis et al. (US 2003/0195897).

Regarding dependent claim 11, Hutson did not expressly disclose determining error of the second visualization with the reduced data set. Agrafiotis discloses a process of figuring out how similar the mapping of points from higher-dimensional space to a lower-dimensional space by using sum-of-squares error function (paragraph 81). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate sum-of-squares error function to determine the similarity of two graphs. One would be motivated to do so because this provides a check of how accurate two graphs are to prevent the

display of misinformation if the two graphs are not similar to each other after compressing the data of the original graph.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Schkilnik et al. (US 2003/0152069) and Deerwester et al. ("Indexing by Latent Semantic Analysis).

Regarding dependent claim 12, Hutson does not expressly disclose determining includes performing a procrustes similarity analysis. Deerwester discloses indexing and retrieval documents (abstract) and a document matrix that contain the frequency of which a term occurs in a document (pg, 10: Table 2). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs and to utilize a document matrix to obtain a frequency certain terms occur in a document. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries

Regarding dependent claim 14, Hutson does not expressly disclose the data stream corresponds to at least one of a number of text documents and a plurality of images. Deerwester discloses indexing and retrieval documents (abstract). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Chakrabarti et al. (US 6,760,724) and Deerwester et al. ("Indexing by Latent Semantic Analysis).

Regarding dependent claim 25, Hutson did not expressly disclose a similarity analysis with the data set. Deerwester discloses indexing and retrieval documents (abstract) and a document matrix that contain the frequency of which a term occurs in a document (pg, 10: Table 2). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs and to utilize a document matrix to obtain a frequency certain terms occur in a document. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Chakrabarti et al. (US 6,760,724).

Regarding dependent claim 32, Hutson did not expressly disclose the data processing subsystem is further operable to generate a reduced data set from the data stream with at least one of wavelet decomposition and vector sampling. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey J. Chow whose telephone number is (571)-272-8078. The examiner can normally be reached on Monday - Friday 10:00AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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